

CLAIMS

1. A transmission screen comprising: a Fresnel lens sheet having a front surface facing the viewer and provided with Fresnel lens elements, and a shading sheet placed contiguously with the front surface of the Fresnel lens sheet;

wherein the shading sheet is provided with shading elements for absorbing external light fallen on the front surface of the shading sheet and reflected in a total reflection mode by the back surface of the Fresnel lens sheet facing a projection light source toward the viewer.

2. The transmission screen according to claim 1, wherein the shading elements transmit external light fallen on the shading sheet at an incident angle θ meeting Expression (1) and penetrated into and diffracted by the shading sheet

$$\theta < 24 + 0.018 \times F \quad \dots\dots\dots (1)$$

where θ is incident angle of external light that falls on the shading sheet and F is the focal length of the Fresnel lens elements in millimeter.

3. The transmission screen according to claim 1 or 2, wherein the shading sheet has a rib group including a plurality of ribs extending in a direction and the shading elements,

each of the shading elements has a total-reflection facet contiguous with the rib and capable of reflecting image light fallen on the back surface of the Fresnel lens sheet on the side of the projection light source in a total reflection mode toward the viewer, and

the shading elements are light-absorbing parts containing a light-absorbing material.

4. The transmission screen according to claim 3, wherein the light-absorbing material is prepared by dispersing light-absorbing particles in a substantially transparent second resin having a refractive index smaller than that of a first resin forming the ribs.

5. The transmission screen according to any one of claims 1 to 4, wherein the shading sheet faces the viewer and the front surface of the shading sheet on the viewer's side is coated with an antireflection layer or a hard coating layer.

6. The transmission screen according to any one of claims 1 to 5 wherein a lenticular lens sheet is sandwiched between the shading sheet and the Fresnel lens sheet,

the lenticular lens sheet is provided with lenticular lens elements arranged along a direction, and

the back surface of the shading sheet on the side of the projection light source and the front surface of the lenticular lens sheet on the viewer's side are adhesively joined together such that the direction along which the lenticular lens elements are arranged and the direction along which the ribs are arranged are perpendicular to each other.